

REMARKS

Claims 78-92, 94-118 and 125-166 are pending. Claims 82-92, 96-106, 108-113, 115-118, 131-141, and 143-161 were objected to as dependent on a rejected base claim and would be allowed if made independent of the rejected base claim. Claims 125 and 126 are amended. Support for the amendment may be found, *inter alia*, in the second full paragraph of page 11, the first full paragraph of page 46, and Examples such as Examples 1-2 to 1-18 of the specification. No new matter is added. Favorable consideration is respectfully requested.

Rejections under 35 U.S.C. 103

Claims 78-81, 94-95, 107, 114, 125-130, 142, and 162-166 were rejected under 35 U.S.C. 103(a) as allegedly being obvious over Yu (US Statutory Invention Registration H766). Specifically, the Examiner asserts that Yu teaches starting materials that may be polymerized with another disclosed catalyst similar to that of the pending claims. Applicants respectfully traverse the rejections.

While not agreeing with the Examiner's rejection of the claims, Applicants' have nonetheless amended claims 125 and 126 to advance prosecution. It is submitted that the Examiner's rejections over Yu are moot in view of such amendments, which further differentiate over Yu.

Claims 125 and 126, as amended, are directed to a method of producing a polyester by contacting an acid component with an alcohol component, in the presence of a catalyst comprising (a) at least one metal-containing component selected from the group consisting of metals and metal compounds which has substantially no catalytic activity for a polyester polymerization; and (b) an organic compound component having at least one moiety represented by "Ar-O<" (Formula 1) and having substantially no catalytic activity for a polyester polymerization, wherein the metal containing component and the organic compound component are added separately. The metal-containing component and the organic compound component together advantageously provide sufficient, increased catalytic activity for producing polyester. See for instance Examples on pages 70-172 of the specification.

Yu discloses that typically the polymerization process is carried out in the presence of an acidic, neutral or basic catalyst, wherein the basic catalyst is preferred. See col. 5, l. 26. "Prior to its introduction into the reaction mass, the preferred basic catalyst is preferably converted to

liquid form, e.g. by melting or by dissolution in a liquid or normally solid, low melting solvent.”

See, e.g., Yu, col. 5, ll. 26-30. Yu discloses, for example, that phenol is the preferred solvent.

See, e.g., Yu, col. 5, ll. 48-49.

Yu also discloses that preferred liquid basic catalysts are charged when dissolved in a molten normal solid –low melting organic solvent such as phenol and that preferred catalysts providing excellent results are the basic catalysts, rubidium phenoxide, potassium phenoxide and potassium borophenoxide, each dissolved in molten phenol. See, e.g., Yu, col. 5, l. 64 – col. 6, l. 2.

Yu further illustrates that according to the conventional practice, onset of reaction in the presence of catalyst is generally at a temperature ranging from above about 100.degree. C. to about 275.degree. C., for example, above about 160.degree. C. for reaction of Bisphenol A, diphenyl terephthalate and diphenyl isophthalate. See, e.g., Yu, col. 6, ll. 12-19. Moreover, Yu discloses that in carrying out the melt polymerization, it is preferred prior to catalyst addition to melt the normally solid reactants to provide molten reactants and then heat the reactants if necessary to a temperature sufficient for onset of polymerization wherein a basic catalyst for the polymerization that is normally solid at 30.degree. C. is then introduced in the liquid form to the polymerization concurrent with the molten reactants. See, e.g., Yu, col. 6, ll. 52-60.

The Office Action states that Yu discloses that a mixture of a metal compound and a phenol may be used as the catalyst. The Office Action appears to equate the phenol used in Yu as the Ar-O- containing organic compound component recited in claim 125. But based on the relevant disclosures of Yu summarized above, it is apparent that Yu does not teach or suggest adding the metal compound and the phenol separately to the polymerization reaction mixture. In Yu’s process of preparing the polyester, the metallic basic catalyst is used in a liquid form by itself in the reaction mixture without any phenol compound, or the metallic basic catalyst is dissolved in phenol and then charged into the reaction mixture.

The determination of obviousness under 35 U.S.C. § 103(a) is based upon the factual inquiries set forth by the U.S. Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 17-18. These factual inquiries are: determining the scope and content of the prior art; ascertaining the differences between the prior art and the claims in issue; resolving the level of ordinary skill in the pertinent art; and evaluating evidence of secondary considerations. *Id.* In formulating an obviousness rejection based upon a combination of prior art elements, it is necessary for the

Office to identify a reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed. When performing this analysis,

[I]t will often be necessary to look to interrelated teachings of multiple patents; to the effect of demands known to the design community or present in the marketplace; and to the background knowledge possessed by a person having ordinary skill in the art. To facilitate review, this analysis should be made explicit.

KSR Int'l Co. v. Teleflex Inc., 550 U.S. ___, 127 S. Ct. 1727, 1740-41 (2007).

Nowhere did Yu disclose, teach or suggest adding a metal containing component having substantially no catalytic activity for polyester polymerization and an organic compound component having substantially no catalytic activity for polyester polymerization separately to produce a polyester, as recited in Claims 125 and 126. In fact, Yu only discloses a basic catalyst **dissolved in a phenol solvent**.

On the contrary, the present invention combines a metal containing component and an organic compound component each of which has low catalytic activity to produce a catalyst having uniquely high catalytic activity as polyester polymerization catalyst. Thus, the catalyst is completely different from the catalyst disclosed by Yu.

In addition, adding the metal containing component and the organic compound component separately to the reaction mixture provides at least the following advantages. First, the metal containing component is not limited to metal compounds that are soluble in the organic compound component. Secondly, the amount of the metal containing component and the organic compound component can be adjusted separately to achieve the most suitable catalytic activity. Thirdly, in a continuous polymerization process, adding those two components separately provides the possibility of changing the addition amount of each component to the reaction system according to the grade of polymer produced and the situation of the production. Fourthly, the catalyst in the present invention may be added before the initiation of an esterification reaction or a transesterification reaction or at any time during the course of the reaction. See last paragraph on page 45 of the specification. These advantages cannot be achieved by the disclosure of Yu.

It is therefore respectfully submitted that Claims 125 and 126 are not taught or suggested by Yu and are therefore patentable. Accordingly, reconsideration and withdrawal of the

rejection of Claims 125 and 126 under 35 U.S.C. § 103(a) as being unpatentable over Yu is respectfully requested.

Furthermore, applicants emphasize that the metallic basic catalyst of Yu is not a metal-containing component having substantially no catalytic activity for polyester polymerization. Nothing in the cited prior art or the knowledge in the art teaches or suggests that modifying the process of Yu by replacing the catalyst used by Yu with a metal-containing component having substantially no catalytic activity for polyester polymerization would work. This is another reason why claims 125 and 126 would not have been obvious over Yu.

An additional reason why claim 126 would not have been obvious over Yu is that Yu does not teach or suggest using a catalyst comprising a metal-containing component having substantially no catalytic activity for a polyester polymerization and an organic compound component having substantially no catalytic activity for polyester polymerization, wherein the organic compound component contains at least one Ar-N< moiety. The phenol solvent or ether type solvent used in Yu (see col. 5, ll. 48-63) is not the organic compound component containing at least one Ar-N< moiety recited in claim 126. Based on the prior art, there is no reasonable expectation that modifying Yu's process by replacing the phenol solvent or ether type solvent with an organic compound component contains at least one Ar-N< moiety would work.

Claims 78-81, 94-95, 107, 114, 127-130, 142, and 162-166 are dependent upon either Claim 125 or 126, and thus include each and every feature of the corresponding independent claims. Each of Claims 78-81, 94-95, 107, 114, 127-130, 142, and 162-166 is therefore allowable for at least the reasons given above for Claims 125 and 126.

CONCLUSION

For at least the above reasons, applicants respectfully submit that the instant application is in condition for allowance, and request a notice from the USPTO to that effect. The Examiner is encouraged to contact applicants' representative at 202-220-4223 to resolve any outstanding issues.

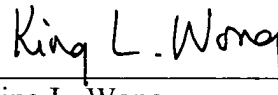
In the event that the filing of this paper is deemed not timely, applicants petition for an appropriate extension of time. The Office is authorized to charge any fees (except for an issue fee), including fees for extensions of time, or credit any overpayment, to Deposit Account No. 11-0600 referencing Docket No. 11197/5.

Respectfully submitted,

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Date: February 1, 2008

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